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(54) Title: NEW POROGENS FOR POROUS SILICA DIELECTRIC FOR INTEGRAL CIRCUIT APPLICATIONS

(57) Abstract: The invention relates to the production of nanoporous silica dielectric films and to semiconductor devices and integrated circuits comprising these improved films. The nanoporous films of the invention are prepared using silicon containing pre-polymers and are prepared by a process that allows crosslinking at lowered gel temperatures by means of a metal-ion-free onium or nucleophile catalyst.



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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/316 H01L21/312 C08J9/26

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUM	ENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Х	WO 01 86709 A (HONEYWELL INT INC) 15 November 2001 (2001-11-15) claims 1-35 page 9, line 11 - line 19 page 12, line 4 - line 34 page 13, line 1 - line 8 page 14, line 3 -page 15, line 33 page 18, line 9 - line 25	1-46
X	EP 1 088 848 A (SHIPLEY COMPANY LLC) 4 April 2001 (2001-04-04) claims 1-29 page 3, line 57 -page 4, line 10 page 7, line 53 -page 8, line 35 page 9, line 50 - line 56 -/	1,34

Further documents are listed in the continuation of box C.	χ Patent family members are listed in annex.			
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Date of the actual completion of the international search 16 December 2002 Name and mailing address of the ISA	Date of mailing of the International search report 30/12/2002 Authorized officer			
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Depijper, R			



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	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 035 183 A (CATALYSTS & CHEM IND CO) 13 September 2000 (2000-09-13) claims 1-8 page 3, line 27 - line 47 page 4, line 5 - line 39 page 4, line 56 -page 6, line 3 page 6, line 23 - line 25	1,34,39
Ε	WO 02 065534 A (CHEMAT TECHNOLOGY INC ;SHI YUWEN (US); BALL IAN J (US); JANG QIN () 22 August 2002 (2002-08-22) claims 1-24 page 4, line 3 - line 33 page 6, line 3 -page 9, line 16	1-4,34
Α	WO 00 13220 A (ALLIED SIGNAL INC) 9 March 2000 (2000-03-09) claims 1-26 page 9, line 13 - line 24 page 1, line 21 -page 12, line 24	1
A	EP 1 142 832 A (APPLIED MATERIALS INC; AIR PROD & CHEM (US)) 10 October 2001 (2001-10-10) claims 1-15 page 7; example 1 page 3, line 30 -page 4, line 9 page 4, line 45 -page 5, line 29	

MERNATIONAL SEARCH REPORT

information on patent family members

PCT/US 02/15255

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
WO 0186709	15-11-2001	AU WO	6117501 A 0186709 A2	20-11-2001 15-11-2001
EP 1088848	04-04-2001	US CN EP JP	6420441 B1 1297963 A 1088848 A1 2001210142 A	16-07-2002 06-06-2001 04-04-2001 03-08-2001
EP 1035183	13-09-2000	EP US WO	1035183 A1 6451436 B1 0018847 A1	13-09-2000 17-09-2002 06-04-2000
WO 02065534	22-08-2002	US WO	2002132496 A1 02065534 A1	19-09-2002 22-08-2002
WO 0013220	09-03-2000	US AU CN EP JP WO	6037275 A 5397599 A 1325541 T 1110239 A1 2002524848 T 0013220 A1	14-03-2000 21-03-2000 05-12-2001 27-06-2001 06-08-2002 09-03-2000
EP 1142832	10-10-2001		1142832 A1 2002026003 A 2002042210 A1	10-10-2001 25-01-2002 11-04-2002